

## Claims

1. A method for reducing load of Home Subscriber Server (HSS)'s interface, comprising:

upon receiving a request message from Serving Call Session Control Function (S-CSCF) comprising a request for a storing name of the S-CSCF and for downloading a user's subscription information, a HSS first storing the name of S-CSCF in the request message, then returning to the S-CSCF a response message comprising the user's subscription information.

2. The method according to Claim 1, further comprising: upon receiving a request message from Interrogating Call Session Control Function (I-CSCF) for inquiring about the information of S-CSCF, the HSS returning to the I-CSCF an inquiry response message comprising the information needed for determining an S-CSCF; according to the returned information in the response message, the I-CSCF determining the S-CSCF that has the capability to serve a User Equipment (UE) and forwarding the request message of the UE to the determined S-CSCF.

3. The method according to Claim 2, wherein, when a Public User Identity performs registration for the first time,

if there is at least one Public User Identity of the UE requesting registration that has been registered in the HSS and the registration is still valid, and if the HSS decides there is no need for the I-CSCF to re-select an S-CSCF to serve the UE, said information needed for determining the S-CSCF comprises the name of the S-CSCF that is serving the UE;

if there is at least one Public User Identity of the UE of which the registration status is unregistered or the registration has expired thereof but the HSS still stores the name of the S-CSCF that was used by the UE last time, or if the UE has been assigned an S-CSCF by the HSS as an unregistered party that is called, said information needed for determining the S-CSCF comprises the name of the S-CSCF that has served the UE;

if HSS has stored the name of the S-CSCF that has served the UE and the HSS is not sure whether it is needed for the I-CSCF to re-select an S-CSCF to serve the UE,

said information needed for determining an S-CSCF comprises the name of the S-CSCF that has served the UE and the S-CSCF capability information set that has the capability to meet the most strict service subscription requirement of the UE requesting registration;

if the HSS does not store the name of the assigned S-CSCF that has served the UE, then said information needed for determining an S-CSCF comprises the S-CSCF capability information set that has the capability to meet the most strict service subscription requirement of the UE requesting registration.

4. The method according to Claim 3, wherein,

if the information returned from the HSS comprises only the name of S-CSCF, said determining the S-CSCF that has the capability to serve the UE for I-CSCF further comprises: the I-CSCF using the S-CSCF in the returned information as the S-CSCF that has the capability to serve the user;

if the information returned from the HSS comprises only the S-CSCF capability information set that has the capability to meet the most strict service subscription requirement of the UE requesting registration, said determining the S-CSCF that has the capability to serve the UE for I-CSCF further comprises: the I-CSCF selecting a new S-CSCF that has the capability to meet the current service requirement of the UE according to the S-CSCF capability information set in the returned response message, and determining the newly-selected S-CSCF as the S-CSCF that has the capability to serve the UE;

if the information returned from the HSS comprises the name of S-CSCF and S-CSCF capability information set that has the capability to meet the most strict service subscription requirement of the UE requesting registration, said determining the S-CSCF that has the capability to serve the UE for I-CSCF further comprises: the I-CSCF verifying according to the returned name of S-CSCF whether the S-CSCF has the capability to meet the current service requirement of the UE, if yes, determining the returned S-CSCF is the S-CSCF that has the capability to serve the UE, otherwise, selecting a new S-CSCF that has the capability to meet the current service demand of the UE according to the S-CSCF capability information set in the response message,

and determining the newly-selected S-CSCF is the S-CSCF that has the capability to serve the UE.

5. The method according to Claim 2, after the HSS receives the request message for inquiring the information of S-CSCF from the I-CSCF, further comprising: deciding according to the user's subscription information and the policy of the operator that the UE is permitted to perform a registration request in the current network before subsequent steps are executed.

6. The method according to Claim 2, wherein, when a Public User Identity performs registration for the first time,

the message received by the HSS from the I-CSCF for inquiring the information of S-CSCF is carried by a Cx-Query message; and said inquiry response message returned to the I-CSCF from the HSS further comprises the information needed for determining an S-CSCF is carried by a Cx-Query Resp message, or,

the message received by the HSS from the I-CSCF for inquiring the information of S-CSCF is carried by a Cx-Select-pull message; said inquiry response message returned to the I-CSCF from the HSS further comprises the information needed for determining an S-CSCF is carried by a Cx-Select-pull Resp message.

7. The method according to Claim 2, wherein, when the UE is in a session,

if the HSS has stored the name of the S-CSCF that has served or is serving the UE, the HSS will, according to system configuration, return to the I-CSCF a response message comprising the name of the S-CSCF, and the I-CSCF will forward the session request message of the UE to the S-CSCF; or the HSS will return to the I-CSCF a response message comprising the information of the name of the S-CSCF and the S-CSCF capability information set that has the capability to meet the most strict service subscription requirement of the UE, and the I-CSCF will determine an S-CSCF that has the capability to serve the user and forwards the session request message of the UE to the determined S-CSCF;

if there is no S-CSCF stored in the HSS that has served the UE, the HSS will directly return to the I-CSCF a response message comprising the S-CSCF capability information set that has the capability to meet the most strict service subscription

requirements of the UE before the I-CSCF determines an S-CSCF that has the capability to serve the UE and forwards the session request message of the user to the determined S-CSCF.

8. The method according to Claim 2, wherein, when the UE is in a session,

the message received by the HSS from the I-CSCF for inquiring about the information of S-CSCF is carried by a Cx-Location-Query message; and said inquiry response message returned to I-CSCF from HSS further comprises the information needed for determining an S-CSCF is carried by a Cx-Location-Query Resp message, or,

the message received by the HSS from the I-CSCF for inquiring about the information of S-CSCF is carried by a Cx-Select-Pull message; and said inquiry response message returned to the I-CSCF from the HSS further comprises the information needed for determining an S-CSCF is carried by a Cx-Select-Pull Resp message.

9. The method according to Claim 1, wherein,

the request message comprising the request for storing the name of the S-CSCF and for downloading the user's subscription information is carried by a Cx-Put message said response message returned to S-CSCF by HSS is carried by a Cx-Put Resp message, or,

the request message comprising the request for storing the name of the S-CSCF and for downloading the user's subscription information is carried by a Cx-Pull message, and said response message returned to the S-CSCF by the HSS is carried by a Cx-Pull Resp message.

10. The method according to Claim 1, wherein said user's subscription information in the response message returned to the S-CSCF comprises at least the user profile information.

11. A method for reducing load of Home Subscription Server (HSS)'s interface, comprising:

upon receiving a message from a I-CSCF for inquiring about the information of S-CSCF, a HSS returning to the I-CSCF an inquiry response message comprising a information needed for determining an S-CSCF; the I-CSCF determining a S-CSCF that has the capability to serve a UE and forwarding request message of the UE to the determined S-CSCF.

12. The method according to Claim 11, wherein, when a Public User Identity performs registration for the first time,

if there is at least one Public User Identity of the UE requesting registration that has been registered in the HSS and the registration is still valid, and the HSS determines there is no need for the I-CSCF to re-select an S-CSCF to serve the UE, then said information needed for determining an S-CSCF comprises the name of the S-CSCF that is serving the UE;

if there is at least one Public User Identity of the UE requesting registration of which the registration status is unregistered or the registration has expired, but the HSS still stores the name of the S-CSCF that was used by the UE last time, or if the UE has been assigned an S-CSCF by the HSS as an unregistered party that is called, then said information needed for determining an S-CSCF comprises the name of the S-CSCF that has served the UE;

if HSS has stored the name of the S-CSCF that has served or is serving the UE and the HSS is not sure whether it is needed for the I-CSCF to re-select an S-CSCF to serve the UE, then said information needed for determining an S-CSCF comprises the name of the S-CSCF that has served or is serving the UE and the S-CSCF capability information set that has the capability to meet the most strict service subscription requirement of the UE requesting registration;

if there is no assigned S-CSCF that has served the UE stored in the HSS, then said information needed for determining an S-CSCF comprises the S-CSCF capability information set that has the capability to meet the most strict service subscription requirement of the UE requesting registration.

13. The method according to Claim 12, wherein,

if the information returned from the HSS comprises only the name of S-CSCF, said determining the S-CSCF that has the capability to serve the UE for I-CSCF further comprises: the I-CSCF determining the S-CSCF in the returned information is the S-CSCF that has the capability to serve the UE;

if the information returned from the HSS comprises only the S-CSCF capability information set that has the capability to meet the most strict service subscription requirement of the UE requesting registration, then said determining the S-CSCF that has the capability to serve the UE for I-CSCF further comprises: the I-CSCF selecting a new S-CSCF that has the capability to meet the current service requirement of the UE according to the S-CSCF capability information set in the returned response message, and determining the newly-selected S-CSCF as the S-CSCF that has the capability to serve the UE;

if the information returned from the HSS comprises the name of S-CSCF and S-CSCF capability information set that has the capability to meet the most strict service subscription requirement of the UE requesting registration, then said determining the S-CSCF that has the capability to serve the UE for I-CSCF further comprises: the I-CSCF deciding according to the returned name of S-CSCF whether the S-CSCF has the capability to meet the current service requirement of the UE, if yes, determining the S-CSCF in the returned information is the S-CSCF that has the capability to serve the UE, otherwise, selecting a new S-CSCF that has the capability to meet the current service requirement of the UE according to the S-CSCF capability information set in the response message, and determining the newly-selected S-CSCF as the S-CSCF that has the capability to serve the user.

14. The method according to Claim 11, after the HSS receives the message for inquiring about the information of S-CSCF from the I-CSCF, further comprising: deciding according to the user's subscription information and the policy of the operator that the UE is permitted to perform a registration request in the current network before subsequent steps is executed.

15. The method according to Claim 11, wherein, when a public user identifier performs registration for the first time,

the message received by the HSS from the I-CSCF for inquiring about the information of S-CSCF is carried by a Cx-Query message; and said inquiry response message returned to the I-CSCF from the HSS comprises the information needed for determining an S-CSCF is carried by a Cx-Query Resp message, or,

the message received by the HSS from the I-CSCF for inquiring about the information of S-CSCF is carried by a Cx-Select-Pull message, and said inquiry response message returned to the I-CSCF from the HSS comprises the information needed for determining an S-CSCF is carried by a Cx-Select-Pull Resp message.

16. The method according to Claim 11, wherein, when the UE is in a session,

if the HSS has stored the name of the S-CSCF that has served or is serving the UE, the HSS will, according to system configuration, return to the I-CSCF a response message comprising the name of S-CSCF, and the I-CSCF will forward the session request message of the UE to the S-CSCF; or the HSS will return to the I-CSCF a response message comprising the S-CSCF name and S-CSCF capability information set that has the capability to meet the most strict service subscription requirement of the UE, and the I-CSCF will determine an S-CSCF that has the capability to serve the user and forwards the session request message of the UE to the determined S-CSCF;

if there is no S-CSCF stored in the HSS that has served the UE, the HSS will directly return to I-CSCF a response message comprising the S-CSCF capability information set that has the capability to meet the most strict service subscription requirement of the UE before I-CSCF determines an S-CSCF that has the capability to serve the UE and forwards the session request message of the UE to the determined S-CSCF.

17. The method according to Claim 11, wherein, when the UE is in a session,

the message received by the HSS from the I-CSCF for inquiring about the information of S-CSCF is carried by a Cx-Location-Query message, and said inquiry response message returned to the I-CSCF from the HSS comprises the information

needed for determining an S-CSCF is carried by a Cx-Location-Query Resp message,  
or,

the message received by the HSS from the I-CSCF for inquiring about the information of S-CSCF is carried by a Cx-Select-Pull message, and said inquiry response message returned to the I-CSCF from the HSS comprises the information needed for determining an S-CSCF is carried by a Cx-Select-Pull Resp message.